Physical movement competencies assessment or physical literacy assessment for physical conditioning students?

Accepted 22nd July, 2019

ABSTRACT

Main aim of this study was to compare the assessment of movement pattern competencies based on movement competencies alone versus assessment based on the concept of physical literacy. The differences in physical literacy-based assessment include physical competency domain and four other domains (motivation, confidence, physical competence, knowledge and understanding). Becoming physically literate with all basic’s movement in strength training exercises is important especially for future exercise trainers or educators. Forty-five physical conditioning students (17 female and 28 male) voluntarily participated in this study. Participants performed five basic movement based on Movement Competency Screening (MCS) instrument (squat, bend-and-pull, lunges-and-twist, push-up and single leg squat). Scores were then given based on CelikFizikal Malaysia (CFM-1) physical literacy assessment instrument’s scoring system. The findings showed that physical competency level significantly differed from physical literacy level in all five movement patterns. The results also showed that majority of participants were motivated, have confidence, were knowledgeable and have understanding on proper technique of performing the movement pattern. Yet majority of them were unable to perform all of the movements with adequate physical competence. In conclusion, being physically competence is not necessarily being physically literate and vice-versa. Physical trainers and educators may benefit more by applying physical literacy assessment as part of pre-participation and monitoring, rather than traditionally assessing physical competencies alone. Assessment based on the concept of physical literacy is more beneficial and suitable with the concept of lifelong education and application.

Key words: Physical literacy, physical education, physical conditioning, movement pattern, movement analysis.

INTRODUCTION

Physical literacy has been accepted as having the motivation, confidence, knowledge, understanding and physical competence to perform physical activities (Whitehead, 2001, 2010). These domains of physical literacy are suggested as influencing lifelong practice of physical activity for lifelong health and fitness purposes.

Movement competency screening involving the body weight squat, lunge-and-twist, push-up, bend-and-pull, and single leg squat has been proposed, and widely used as a simple assessment tools to assess physical readiness for participation, in a strength and conditioning program (Kritz, 2012; Kritz et al., 2009). Physical conditioning students during their official educational process are normally taught and practically assessed on their ability to perform all of these basic movement patterns. Being physically competence and having the knowledge in all of
these movement patterns can be considered as a prerequisite for passing the physical conditioning related courses.

The concept of physical literacy and its assessment so far seems to be more popular and researched by physical education fraternity, with almost exclusively involving only early childhood’s fundamental movement skills (Giblin et al., 2014; Liu et al., 2017; Longmuir et al., 2017; Lounsbery and McKenzie, 2015). Strength and conditioning practitioners and educators on the other hand, seems to be more focus on movement competency in strength related exercise or movement techniques (Comeau et al., 2017; Kritz et al., 2009; Lisman et al., 2013).

The questions that now arise is, will it be more beneficial, if instead of assessing physical competencies alone, any fitness clients or future physical trainers or educators assess their physical literacy level? The concept of physical literacy is said for lifelong application. Then the assessment should not be limited only to early childhood and fundamental movement skills such as walking, jumping, catching etc. Utilizing the physical literacy concept with other sets of human movement patterns or skills may seems more logical in practical, taking into consideration that human movement skills and mobility ability fluctuates throughout life span, depending on many factors such as ageing, level of physical activities, types of training and many more (Batt, 2018; Mason and Maleszka, 2017; Tulle, 2018).

Therefore, the objectives of this study were to investigate if physical literacy assessment output will be differ from physical competencies output, and determine how actually future trainers under learning condition will scores in term of their motivation, confidence, knowledge, understanding and physical competence domains.

MATERIALS AND METHODS

Experimental Approach to the Problem

Five basic movement patterns normally involve in strength training exercise programming were selected to be used. The movement patterns involved were body weight squat, lunge and twist, push-up, bend and pull, and single leg squat. The movement patterns were originally from the Movement Competency Screening (MCS) instrument (Kritz, 2012; Kritz et al., 2009). The MCS were selected as it provides proper movement screening criteria based on proper scientific research, and can be used together with the CelikFizikal (CFM-1) physical literacy assessment instrument (Mohamad et al., 2018). CFM-1 provides general assessment guideline and scoring system for each domain of physical literacy (motivation, confidence, physical competence, knowledge and understanding). Participants attended one familiarisation session and one testing occasion. During the testing occasion participants performed each of the movement pattern. MCS movement pattern criteria for screening were used with CFM-1 scoring system.

Subjects

Forty-five students (17 female and 28 male) were recruited for the purpose of this study. Participants age were 21 ± 0.30 years old, with body weight 59.76 ± 10.78 kg and body height of 165.78 ± 8.10 m. Participation in this research was voluntary, in accordance with the ethical standards of the committee responsible for human experimentation and the Declaration of Helsinki of 1975 revised in 2008 (Association, 2014). Only healthy participants with no injury and enrolled in the physical conditioning related classes at the Faculty of Sports Science and Coaching, Sultan Idris Education University during the time of the data collection were recruited.

Procedures

Each participant attended one briefing session and one testing occasion. The briefing session involves explanation on the nature of the study, inform consent for voluntary participation in the study, and brief conceptual introduction to movement pattern involved. Injury record or physical readiness was determined using pre-exercise questionnaire (PAR-Q) (Warburton et al, 2018) during the same session.

The testing occasion took place after at least 48 h of the briefing session. The gap period ensures each participant were tested when they were physically, emotionally and mentally ready and in fresh condition. The testing occasion started with the participant’s standing in anatomical ready position, and perform the movement based on instructions given by the researcher. The sequence of the movement pattern was all based on suggested sequences given in the MCS instruction. Each movement pattern performed by each participant were video-recorded for further analysis later. This ensures the CFM-1 analysis will be done properly for each participant by the researcher. Verbal questions were asked during the performance of each movement pattern based on the CFM-1 instrument guideline.

Data and statistical analyses

Video-recording were then analysed with assistance of the Kinovea motion analysis software (Whatman and Reid, 2017) to allow for angle measurement and determination of appropriate movement pattern competencies based on MCS criteria and CFM-1 scoring system. All data recorded in the CFM-1 form were then converted into numerical data as per CFM-1 guideline and transferred into Microsoft Excel (Bree and Gallagher, 2016) for further statistical analysis.
Scoring points derived from the CFM-1 for each domain of physical literacy and each movement patterns were calculated and transform into percentage for ease of understanding and equated scores comparisons. CFM-1 scoring system has 13 points full scores for each movement patterns. CFM-1 scoring system for movement competency domain alone has 5 points full scores for each movement patterns. Mean and standard deviation were calculated from it and produced as representation of centrality of the data. Shapiro-Wilk test for normality used indicated normal distribution of data gathered. Paired sample T-Test were used to compare physical competencies percentage of scores of each movement pattern alone versus overall physical literacy percentage of scores.

### RESULTS AND DISCUSSION

Statistical analysis performed indicated that highest scores are all below 61% for all movement pattern. Interestingly participants were significantly scored higher points for physical movement competencies for all movement patterns as compared with the physical literacy scores. The result shown in Table 1 suggests that participants physical competence in the entire movement pattern does not necessarily means that they are physically literate in it (example motivated to do; have knowledge, have confidence and/or have understandings).

If observed from domain by domain point of view as indicated in Table 2, majority of the participants did have the motivation, knowledge, confidence and understanding of each of the movement pattern. But when it comes to actual practical based competencies, only a few successfully performed it.

While looking at the results presented in Table 1, it should be noted that the physical literacy scores also includes the movement competencies scores in it. Thus, as soon as all scores for all domains have been counted and averaged, the weak or lower scores in certain domain may negatively affect overall scores of physical literacy. The movement competencies domain scores were not omitted from overall physical literacy scores due to reason that the concept and term of physical literacy must include all five domains. Without one of its domains, it cannot be considered as scores representing physical literacy.

From Table 2 it can also be clearly seen that single-leg squat and bend-and-pull have the lowest percentage of participants that is able to perform it appropriately (physical competence). This can simply be attributed to the weak physical strength of body parts needed for that particular movement patterns. This is why the MCS typically used all of these movement patterns as assessment to identify body parts and movements that needs to be trained. These results also show that acceptable level of human movement and mobility can not only be achieved by having the motivation, knowledge, confidence and understanding, without actually performing it and trained it. But in order to sustain lifelong physical fitness practice, physical literacy is needed.

### CONCLUSIONS

It can be concluded that being physically competence
significantly differs from being physically literate. If educating people for lifelong physical fitness practices is the main aim, physical conditioning training alone is insufficient. It must be inclusive with any other types of programs which can motivate, educate, instil confidence and enhance their overall understanding. In terms of physical performance monitoring and pre-participation assessment, having a set of physical literacy related assessment might be more useful than only assessing physical competence as traditionally been practices by many physical trainers and educators. In this study, participants were all physical conditioning students, which may or may not be trainers and educators in the future. The results suggest that they may have adequate theoretical competencies, yet lacking practical competencies.

ACKNOWLEDGMENT

This study is part of the ongoing research on physical literacy by Special Interest Group in Strength and Conditioning (SIGCONDITIONING) at Sultan Idris Education University (UPSI)

REFERENCES


Cite this article as:


Submit your manuscript at

http://www.academiapublishing.org/ajer